

## **Efficacy of Leishman Stain in Cytology - A 30 Years Experience**

**Dr. Niranjana Rout**

*Professor & Head Of Pathology, Acharya Harihar Regional Cancer Centre, Cuttack – 753007, Odisha, India*

---

**Abstract:** *Leishman stain is one of the Romanowsky stains and is used extensively for interpretation of hematology smears in both urban and rural laboratories. In contrast Papanicolaou and HE (Hematoxylin & Eosin) method of staining are often not available in rural laboratories in resource constrained regions. With this in mind we started using the Leishman stain. In the initial years, we stained cytosmears simultaneously with Leishman stain and Papanicolaou method and interpreted and compared our observations. We have been using Leishman staining technique to interpret cytosmears for last 30 years and also applied this technique to interpret cytology smears in health camps organised at community level in rural areas. Thus, Leishman staining is a simple, quick and inexpensive staining technique easily available in both urban and rural laboratories which can be used as an efficacious tool to interpret cytosmears.*

---

Cytological interpretation relies heavily on the quality and appearance of the staining technique. Three staining techniques are in routine practice - Papanicolaou method for alcohol fixed wet smears, air dried smears stained with Romanowsky stains and Hematoxyline-Eosin (HE) stain.

Leishman stain is one of the Romanowsky stains and is used extensively for interpretation of hematology smears in both urban and rural laboratories. In contrast Papanicolaou and HE method of staining are often not available in rural laboratories in resource constrained regions. With this in mind we started using the Leishman stain to interpret cytosmears since 1984. [1]

In this method, similar to the blood smears the cytosmears are air-dried and put on a staining tray, and the Leishman stain is then poured on to cover the cytosmear. Thirty seconds is allowed for fixation after which an equal amount of distilled water is added. After 3 to 5 minutes, the slides are washed with running tap water and examined under the microscope.

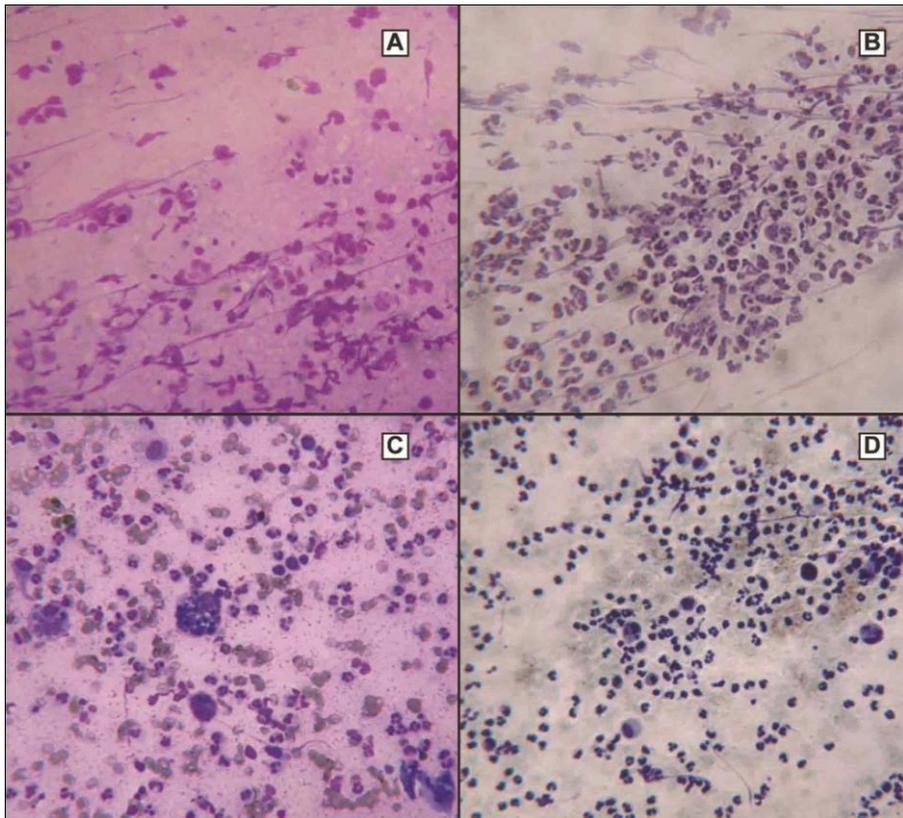
In the initial years, we stained cytosmears simultaneously with Leishman stain and Papanicolaou method and interpreted and compared our observations. [2] In one of our study, [3] while comparing the outcome from 882 smears from different lesions stained by both Leishman method and Papanicolaou method of staining (Fig.1,a,b,c,d & Fig.2,e,f,g,h Fig.3,I,j,k,l), we observed that in only 4.7% cases we failed to reach at a diagnosis with Leishman stain. In some of these cases, nuclear details were not clear. Many pathologists feel that fine nuclear structure is not well demonstrated in air dried Giemsa Stains,[4] but on the other hand, nuclear characteristics such as chromatin, nucleoli and nuclear membrane are better visualised in wet-fixed pap-stained smears.[5] We have been using Leishman staining technique to interpret cytosmears for last 30 years and also applied this technique to interpret cytology smears in health camps organised at community level in rural areas.

Thus, Leishman staining is a simple, quick and inexpensive staining technique easily available in both urban and rural laboratories which can be used as an efficacious tool to interpret cytosmears.

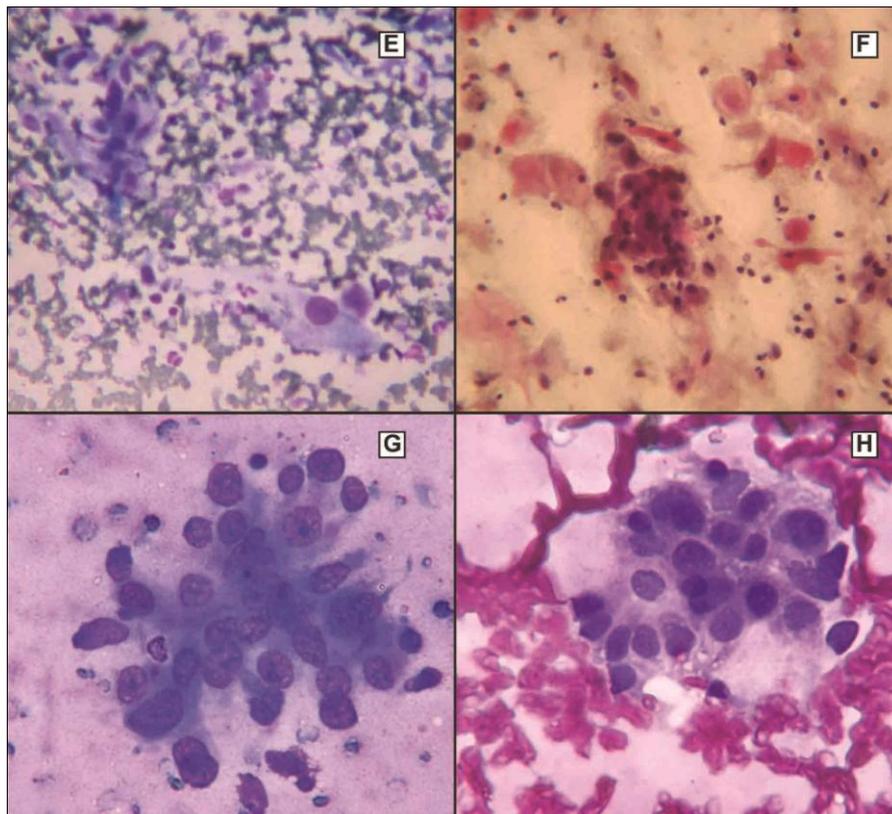
### **References**

- [1]. Niranjana Rout, G.S. Acharya, B.K. Nanda .Efficacy of Leishman stain in cytology (Abstract no. 99).33rd National Conference of Indian Association of Pathologists and Microbiologists, Manipal (Karnatak) 20-22 December 1984.
- [2]. Rout N, Singh SP, Satpathy B, Nanda BK. Rapid cytodiagnosis of endoscopic biopsy specimens in gastro-oesophageal malignancy. *Trop Gastroenterol*1993; 14:99-103.
- [3]. M. Swain, N. Rout, S. Samantray, B.K. Nanda. Is Leishman stain useful for community cytology? *Acta Cytol* 2010; 54 Suppl 3: 397.
- [4]. With P. Vielh. The techniques of FNA cytology. In : Svante R Orell, Gregory F Sterrett, Max N-I Walters, Darrel Whitaker, editors. *Manual and atlas of fine needle aspiration cytology*. 3rd ed.London : Churchill Livingstone;1999. pp. 09-27.
- [5]. Gita Jayaram. *Atlas and text of thyroid cytology*.1st ed. New Delhi: Arya Publications; 2006. pp.09.

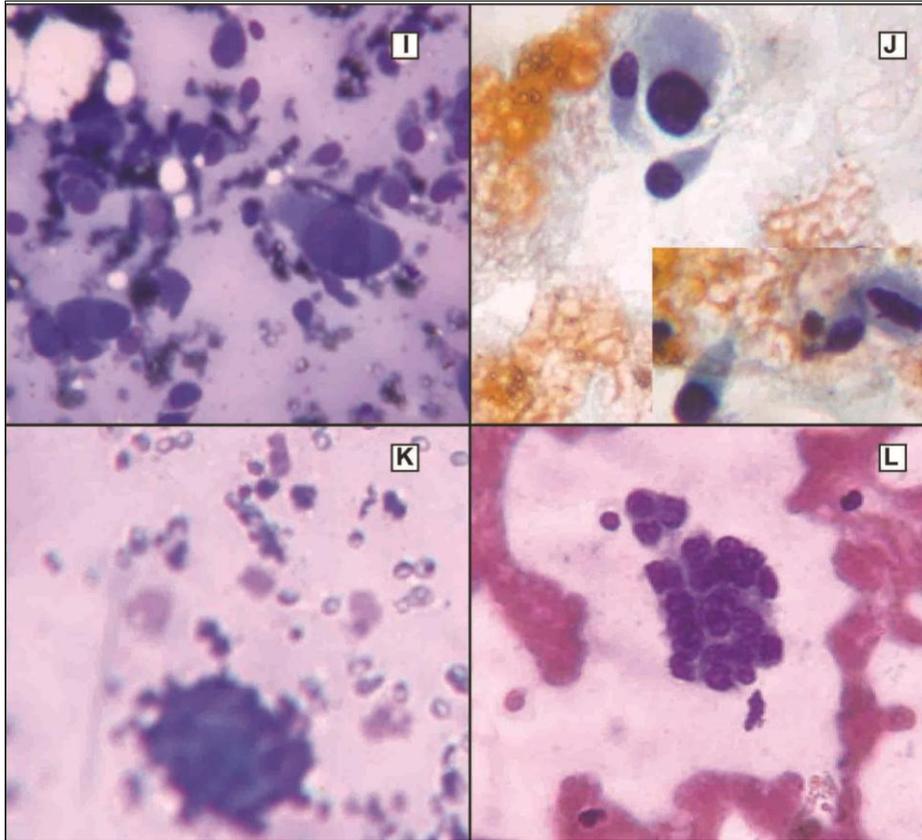
Figure legend:



**Fig.1** (A) Acute inflammatory Cells (Leishman x 100), (B) Acute inflammatory Cells (Pap x 100), (C) Chronic inflammatory Cells (Leishman x 100), (D) Chronic inflammatory Cells (Pap x 100).



**Fig.2** (E) Squamous Carcinoma Cells (Leishman x 400), (F) Squamous Carcinoma Cells (Pap x 400), (G) Adenocarcinoma Cells (Leishman x 400), (H) Adenocarcinoma Cells (Pap x 400).



**Fig.3** (I) Soft tissue Sarcoma Cells (Leishman x 400), (J) Soft tissue Sarcoma Cells (Pap x 400), (K) Poorly differentiated Adenocarcinoma Cells (Leishman x 400), (L) Poorly differentiated Adenocarcinoma Cells (Pap x 400).